United States Department of Agriculture

Animal and Plant Health Inspection Service

National Wildlife Research Center

Wildlife Services Seeking Solutions Through Research

Managing Rodent Damage to Grains, Crops, Reforestation, Livestock, and Property

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National Wildlife Research Center Scientists Assess Nonlethal Techniques to Reduce Rodent Damage

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research facility devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and acceptable methods, tools, and techniques.

Rodents and other wildlife species cause substantial damage to grain crops, forage crops, reforestation, livestock, property, and other resources. A need exists to improve and develop methods and integrated strategies for managing damage. In addition, nonlethal rodent damage management is receiving growing attention among resource managers, landowners, and the general public. NWRC scientists have done research on integrated pest management tools

and continue to work on repellants, barriers, frightening devices, biological control, and cultural methods to manage damage. The goals of this research are twofold. First, NWRC researchers want to develop new and improved repellant and barrier strategies to protect agricultural crops and property from damage caused by voles, pocket gophers, rats, and ground squirrels. Second, researchers want to develop rodent detection methods and attractants to enhance the effectiveness of existing tools, including rodenticides.

Groups Affected By These Problems:

- Urban citizens
- Farmers
- Livestock producers
- Natural resource managers
- Airports
- Military bases

Major Research Accomplishments:

- WS developed an integrated pest management decision-support system for minimizing damage by pocket gophers, deer, and bears.
- WS investigated sterilization as a method to reduce prairie dog colony extension.
- WS reduced cable gnawing by rodents with repellants.
- WS successfully eradicated invasive rats from the National Park Services' Buck Island.

Applying Science and Expertise to Wildlife Challenges

New and Improved Nonlethal Methods—Rapid re-invasion by rodents from surrounding habitats, as well as a high reproductive rates by surviving animals, often reduce the effectiveness of damage reduction methods and increase the frequency and expense of treatment. NWRC scientists have been studying innovative methods to slow or prevent rodent re-invasion and population increases. In many cases, NWRC considers an integrated approach, using

multiple methods to manage rodent populations and damage. For example, scientists are looking at fertility suppression agents for rodents and evaluating certain repellants in combination with various barrier materials that could be more effective than present management methods.

Improved and Safe Uses for Rodenticides—Rodenticides are an important tool in dealing with significant rodent populations and damage. NWRC scientists test rodenticides to assess their efficacy and the hazards they may pose under some circumstances. This information is critical to regulatory agencies that must make decisions on the use of these chemicals for rodent management.

Introduced Rats Eradicated from Buck Island—NWRC scientists and WS operational staff are involved in efforts to reduce island rat populations. On Buck Island, in the U.S. Virgin Islands, the National Park Service (NPS) is contracting with WS to conduct an eradication program. After obtaining registration for a .005-percent diphacinone bait block from the Environmental Protection Agency and the Virgin Islands, bait stations were established over the entire 180-acre island in 1999. During December 2000 and April 2001, no rats were captured over 5 days in any of the trap lines scattered about the island. Many house mice, however, were captured. House mice (another introduced species) have never been reported on the island, but probably have been present for many years. It is likely their numbers were suppressed by the rat population, which is now gone. Only time will tell if this growing mouse population is going to become a problem on the island.

Selected Publications:

- Ahmed, M.D.S.,and L.A. Fiedler. 2002. A comparison of four rodent control methods in Philippine experimental rice fields. International Biodeterioration & Biodegradation 49:125-132.
- Witmer, G., A. Hakim, and B. Moser. 2001. Investigations of methods to reduce damage by voles pp.357-365 in Proceedings of the Ninth Wildlife Damage Management Conference. State College, PA, October 5-8, 2000.
- Engeman, R., and G. Witmer. 2000. Integrated management tactics for predicting and alleviating pocket gopher damage to conifer reforestation plantings. Integrated pest Management Reviews 5:41-55.
- Shumake, S.A., R.T. Sterner, and S.E. Gaddis. 2000. Repellents to reduce cable gnawing by wild Norway rats. *Journal of Wildlife Management* 64:1009-1013.
- Witmer, G., K. VerCauteren, K. Manci, and D. Dees. 2000. Urban-suburban prairie dog management: Opportunities and challenges. Proceedings of Vertebrate Pest Conference 19:439-44.